

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 16

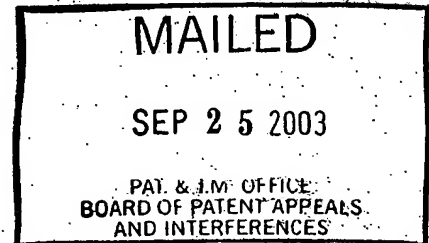
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte LARRY M. CIRJAK, MICHAEL F. LEMANSKI, DAVID R. WAGNER,  
NANCY C. BENKALOWYCZ, PATRICIA R. BLUM, MARC A. PEPERA, and  
CHRISTOS PAPARIZOS

Appeal No. 2003-2012  
Application No. 09/981,454

ON BRIEF



Before KIMLIN, GARRIS, and WARREN, Administrative Patent Judges.  
GARRIS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal which involves claims 16-36.  
These are all of the claims remaining in the application.

The subject matter on appeal relates to a process for  
manufacturing vinyl acetate in a fluid-bed reactor wherein the  
hydrocarbon reactants are fed into the reactor separately from

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the oxygen reactant. Further details concerning this appealed subject matter are set forth in representative independent claim 16 which reads as follows:

16. A process to manufacture vinyl acetate in a fluid-bed reactor containing feed stream inlets and gas outlets, in which a mixture comprising ethylene, acetic acid and an oxygen-containing gas is contacted with a particulate fluid-bed catalyst, comprising:

(a) introducing feed to the reactor in more than one inlet such that a feed stream primarily containing ethylene, acetic acid, or a mixture thereof does not contain oxygen within flammability limits, and such that a feed stream primarily containing an oxygen-containing gas does not contain hydrocarbons within flammability limits;

(b) controlling the amount of oxygen entering the reactor such that the outlet gas mixture is outside flammability limits; and

(c) recovering vinyl acetate.

The references set forth below are relied upon by the examiner as evidence of obviousness:

|   |           |               |
|---|-----------|---------------|
| Calcagno et al. (Calcagno)  | 3,714,237 | Jan. 30, 1973 |
| Sennewald et al. (Sennewald '623)<br>(published Great Britain Patent Application) | 1 266 623 | Mar. 15, 1972 |
| Sennewald et al. (Sennewald '624)<br>(published Great Britain Patent Application) | 1 266 624 | Mar. 15, 1972 |

All of the appealed claims are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sennewald '623 and Sennewald '624 optionally in view of Calcagno.<sup>1</sup>

Rather than reiterate the respective positions advocated by the appellants and by the examiner regarding the above noted rejections, we refer to the brief and to the answer for a complete exposition thereof.

#### OPINION

For the reasons set forth in the answer and below, we will sustain each of these rejections.

As correctly indicated by the examiner, each of the Sennewald references discloses all aspects of the process defined by appealed independent claim 16 except for the here claimed feature wherein the oxygen reactant is introduced into the reactor separately from the ethylene and acetic acid reactants. However, we share the examiner's conclusion that it would have been obvious for one with ordinary skill in the art to introduce oxygen into the fluid bed reactor of the respective Sennewald

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<sup>1</sup>On page 3 of the brief, the appellants state that "[a]ll claims are in one group." In light of this statement, we will focus on independent claim 16 which is the broadest claim on appeal, in assessing the merits of the rejections before us. See 37 CFR § 1.192(c)(7)(2002).

processes separately from the ethylene and acetic acid reactants. This is because the reaction desired in the respective Sennewald processes would be achieved regardless of whether the oxygen is fed separately from or together with the ethylene and acetic acid reactants. Further, the above noted obviousness conclusion is additionally supported by the Calcagno reference which teaches a vinyl acetate manufacturing process wherein the reactants, namely, ethylene and oxygen, are introduced into the reactor either separately or mixed together (e.g., see lines 3-9 in column 2).

With respect to the rejection based on the Sennewald references alone, the appellants argue that the examiner has provided no evidence in support of his obviousness conclusion. This is incorrect. The examiner's obviousness conclusion is supported by his undisputed finding that one with ordinary skill in the art would have expected "all reactants to undergo the same reaction whether the mixing occurs before the reaction zone or within the reaction zone" (answer, page 3; also see the sentence bridging pages 3 and 4 of the first office action mailed January 2, 2002).

The appellants further argue that the examiner's conclusion of obviousness is militated against by the Williams declaration

of record which explains that, in the environment of a fixed-bed reactor process, separately introduced oxygen could cause hot spots and potentially dangerous overheating conditions. While such concerns might dissuade an artisan from introducing oxygen separately in the environment of a fixed-bed reactor process, these concerns would not have dissuaded the artisan from introducing oxygen separately in a fluid-bed reactor process of the type taught by each of the Sennewald references. This is because Sennewald explicitly teaches that dissipation of reaction heat is readily achieved in his fluidized-bed (e.g., see lines 32-36 on page 2 of Sennewald '623 and lines 47-51 on page 2 of Sennewald '624) as correctly pointed out by the examiner in the answer.<sup>2</sup> In light of this teaching that heat dissipation is readily achieved in Sennewald's fluidized-bed, the examiner's obviousness conclusion regarding Sennewald's fluidized-bed process would not be forestalled by the overheating concerns regarding a fixed-bed process.

It is the appellants' further contention that any prima facie case of obviousness established by the examiner is overcome

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<sup>2</sup>Significantly, the appellants have not responded to the examiner's point regarding this aspect of the Sennewald teachings.

by evidence of nonobviousness shown by the Williams declaration and the subject specification in relation to the advantage of separately introduced feed streams. In this regard, the appellants specifically refer to lines 12-20 on page 6 of their specification which states that "[t]his unique feature of the fluid bed process allows significantly higher levels of oxygen to be safely employed in the conversion of acetic acid and ethylene to vinyl acetate without danger of flammability" and that "[t]he utilization of higher levels of oxygen permit substantially higher levels of ethylene and acetic acid conversion than are possible in the fixed bed processes." The appellants' contention lacks persuasive merit.

We acknowledge that the fluidized-bed process under consideration yields higher levels of conversion than are possible in a fixed bed process and that such higher levels of conversion clearly are advantageous. Contrary to the appellants' belief, however, this advantage does not evince nonobviousness. This is because such higher conversion levels would have been expected for a fluidized bed process since each of the Sennewald references expressly teaches this advantage (e.g., see lines 8-16 on page 2 of Sennewald '623 and lines 19-51 on page 2 of Sennewald '624). Concerning this point, we emphasize to the

appellants that expected results, as here, are evidence of obviousness just as unexpected results are evidence of nonobviousness. Viewed from this perspective, the advantage referred to by the appellants reinforces rather than undermines a conclusion of obviousness. See In re Skoll, 523 F.2d 1392, 1396-97, 187 USPQ 481, 484 (CCPA 1975) and In re Skoner, 517 F.2d 947, 950, 186 USPQ 80, 82 (CCPA 1975).

Concerning the Section 103 rejection based on the Sennewald references in view of Calcagno, the appellants reiterate the unpersuasive arguments discussed above. In addition, the appellants point out that the Calcagno process involves a liquid-phase system and that "feeding oxygen directly to a liquid[-]phase system would be an inherently safer system because of the heat transferability of the liquid" (brief, page 7). With these points in mind, the appellants then argue that "there is no apparent motivation to combine liquid-phase art [i.e., Calcagno] with the gas-phase art of Sennewald" (brief, page 7). We cannot agree. The proposed combination of the Sennewald and Calcagno teachings has merit, at least in the sense that Calcagno evinces that separate versus mixed reactant feeds were known alternatives in prior art vinyl acetate processes and thereby reinforces the examiner's obviousness conclusion based on the Sennewald

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references considered alone. Moreover, the appellants' statement that "feeding oxygen directly to a liquid[-]phase system [i.e., the system of Calcagno] would be an inherently safer system because of the heat transferability of the liquid" (id.) reinforces the examiner's previously discussed point and his concomitant obviousness conclusion regarding the Sennewald teaching that heat dissipation is readily achieved in the fluidized bed of the Sennewald process.

For the reasons discussed above and in the answer, it is our determination that the reference evidence adduced by the examiner establishes a prima facie case of obviousness which the appellants have failed to successfully overcome with argument and evidence of nonobviousness. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). It follows that we will sustain the examiner's Section 103 rejection of all appealed claims as being unpatentable over Sennewald '623 and Sennewald '624 optionally in view of Calcagno.

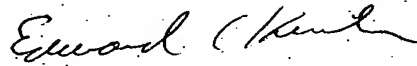


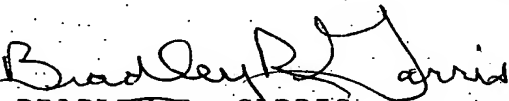
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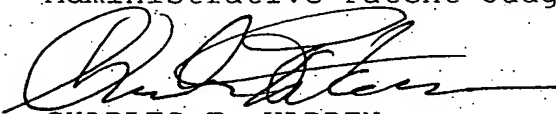
The decision of the examiner is affirmed.

No time period for taking any subsequent action in  
connection with this appeal may be extended under 37 CFR  
§ 1.136(a).

AFFIRMED

  
EDWARD C. KIMLIN )  
Administrative Patent Judge )

  
BRADLEY R. GARRIS )  
Administrative Patent Judge )

  
CHARLES F. WARREN )  
Administrative Patent Judge )

BOARD OF PATENT  
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